STRONG3000

TECHNICAL DATA SHEET

Solution Sheet · Revision: November 2026

SOLUTIONS

Turnkey Wet Enameling Lines

Inner and outer surface enamel for everything from valves, pipes and fittings to cast iron hob grates, pots and pans: a glass layer fused to the metal at about 830 °C that resists water, soil, salt, chemicals and heat.

Open online
strong3000.com/en/solutions/turnkey-wet-enameling-lines/



KEY FIGURES

Type	Air velocity	Filtration	Body
Dry-filter manual / conveyorised line-type	**0.4 – 0.6 m/s**	**Dry-type cardboard/fiber filter**	**Stainless construction**

SYSTEM OVERVIEW

Glass Against Water, Salt and Chemicals.

Wet enamel is made by spraying a liquid enamel (slip) prepared from glass frit, clay and water onto the part, drying it and firing it at about 830 °C. During firing the glass melts and fuses to the steel or cast iron, forming a hard, glassy surface.

On parts with an internal volume, such as valve bodies and pipes, the liquid enamel also covers the inner surface and recesses. STRONG3000 designs the line as one system — from pretreatment and application booths to drying and firing ovens, conveyors and automation. Powder enamel application can also be set up for the same parts.



> Not to be confused with the bitumen- and asphalt-based coatings that the pipe industry also calls “enamel”: vitreous enamel is glass-based and fired in a furnace.

TARGET INDUSTRIES

Where Enamel Comes In.

On valves and pipes in constant contact with water, soil, seawater and chemicals, the surface is the only barrier between the metal and its environment. Enamel builds that barrier as a glass layer fused to the metal.



WATER & WASTEWATER

Valve Enamel Coating

Inner and outer surfaces of gate and butterfly valves, hydrants and fittings. For raw and drinking-water valves, ISO 11177 defines the quality requirements and test methods for the enamel.

Inner + outer surface



INFRASTRUCTURE

Underground Water Pipes

In buried water lines the outer surface meets the moisture and salts in the soil, while the inner surface carries the flowing water. Enamel covers both surfaces with a glass layer.

Soil + water



OIL & GAS

Oil Pipes

Lines carrying crude oil, saline produced water and sand need an inner surface that resists both corrosion and wear.

Inner surface



MARINE & CHEMICAL

Saline and Chemical Environments

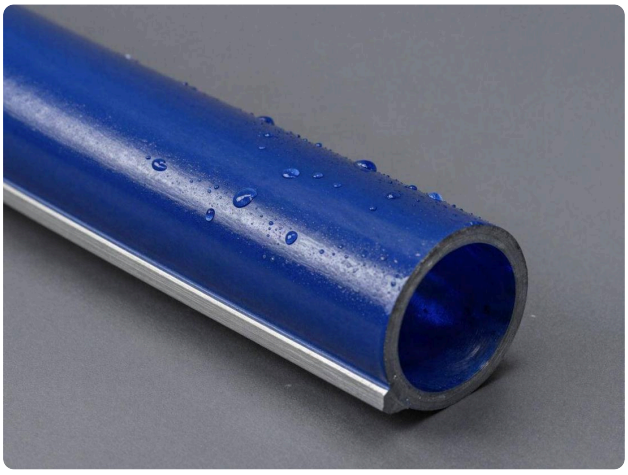
Lines exposed directly to seawater, such as the seawater cooling pipes in a ship's engine room, and chemical process piping that carries acids and alkalis.

Seawater + chemicals

WHY ENAMEL?

A Glass Layer Against Corrosion.

Enamel is not a paint: it is an inorganic glass that bonds chemically to the metal during firing. Its key properties for valves and pipes:



Corrosion Resistance

Covers surfaces in contact with water, seawater and soil with a glass layer fused to the metal.

Chemical Resistance

Resists acids and alkalis; hydrofluoric acid and hot concentrated phosphoric acid are the exceptions.

Smooth Surface

The glassy surface reduces deposits and scale build-up.

Hardness

The hard glass surface resists wear from fluids carrying sand and particles.

Heat Resistance

Its inorganic structure withstands hot water and changes in temperature.

Hygiene

The glass surface is easy to clean and is used on surfaces in contact with drinking water.

PROCESS FLOW

From Pretreatment to Firing, One Line.

Pretreatment
Degreasing & surface preparation

Application
Wet enamel, inside & out

Drying
Removing the water

Firing
About 830 °C

Automation
Conveyor & control

APPLICATION BOOTHS

Dry-Filter Wet Enamel Booths.

Wet enamel is applied with a manual gun in dry-filter booths or automatically in conveyorised line-type booths. The stainless body and efficient air extraction keep the work area clean for the operator.

Type	Dry-filter manual / conveyorised line-type
Air velocity	0.4 – 0.6 m/s
Filtration	Dry-type cardboard/fiber filter
Body	Stainless construction
Application	Wet enamel (slip) — inner and outer surface
Option	Climate room (temperature and humidity control)



> Values are typical ranges; final values are confirmed per project by STRONG3000 engineering.

BOOTH BY PART

Main Coated Products.

Valves are coated in a conveyorised line-type booth; cast iron hob grates, pots and pans in a manual booth with turntables. These are the main examples — for parts from other industries that need wet enamel, the booth and the line are configured to the part.



Conveyorised line-type booth and control panel

Conveyorised line-type booth

Valve Bodies and Fittings

Valve bodies, bonnets and fittings pass through the booth on an overhead conveyor, and the wet enamel is sprayed onto the inner and outer surfaces. The booth is sized to the conveyor line and to the drying and firing steps that follow.

- Continuous part flow on an overhead conveyor
- Controlled from the control panel
- Stainless body and lighting



Enamelled cast iron hob grates

Manual booth · Turntables

Cast Iron Hob Grates

On a hob grate the enamel has to cover every surface, including the undersides of the arms, the edges and the feet. The grates are placed on the turntables of the manual booth, and the operator turns the table to spray the enamel from every angle. Enamel that misses the part collects in trays under the booth, and the booth air passes through a filter.

- Two rotating tables
- Wheeled enamel collection trays
- Filter unit



Manual booth · Turntables

Cast Iron Pots and Casseroles

On pots and casseroles both the deep inner surface and the outer surface are coated; lids are enamelled as separate parts. As the part turns on the table, the enamel also reaches the rims and inner corners.

- Deep inner surface and outer surface
- Lids as separate parts
- Rims and inner corners



Manual booth · Turntables

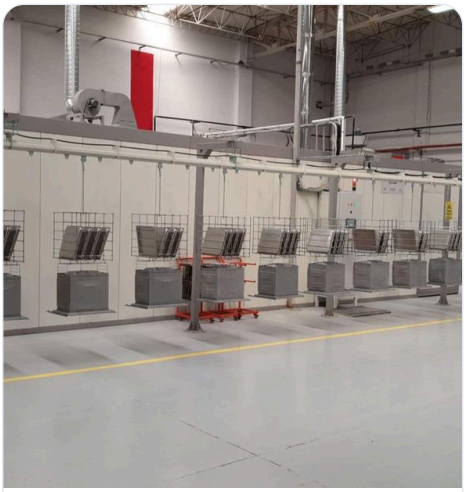
Cast Iron Frying and Grill Pans

On pans the handle and rims are coated together with recessed surfaces such as the ribs of a grill pan. The operator aims the gun to suit the shape of the part, so the enamel reaches the bottom of the channels.

- Handle and rims
- Grill pan ribs
- Gun angle set to the shape of the part

CORE EQUIPMENT

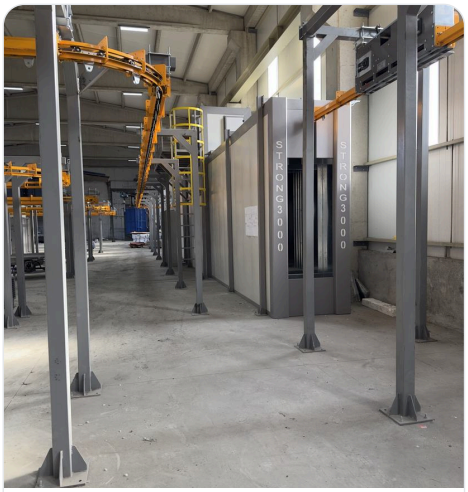
Systems That Complete the Line.



Pretreatment

Degreasing and surface preparation suited to steel and cast iron substrates.

Explore →



Dry-off Oven

Removes the water from the wet enamel in a controlled way before firing.

Explore →



Firing Ovens

Box, conveyor and U-type high-temperature ovens for firing enamel.

Explore →



Climate Room

The application area is enclosed in an insulated room with controlled temperature and humidity.

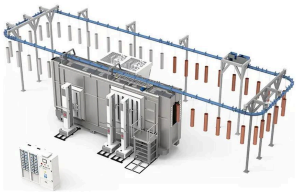
Explore →



Automation

Reciprocators, robotics and conveyor control for consistent, high-volume enameling.

Explore →



Powder Enamel Option

Automatic system that applies powder enamel to the inner and outer surfaces of pipes.

Explore →

ENGINEERING & MANUFACTURING

Designed. Engineered. Manufactured. Under One Roof.

STRONG3000 combines mechanical and electrical engineering, automation, control software and application technology in a single organization — so responsibility for the whole line stays in one place.

Mechanical Engineering
Booths, conveyors, ovens and recovery hardware.

Electrical Engineering
Power, control cabinets and line wiring.

Automation
Reciprocators, robotics and PLC control.

Control Software
Smart AI platform and line integration.

Application Technology
Gun, injector and powder delivery development.

FAT & Commissioning
Factory acceptance testing and on-site start-up.



REFERENCE PROJECT

A Line in the Field.



Wet Enamel | Automatic Line

Valve & Pipe Wet Enamel Line

Automatic line-type wet enamel plant for the inside and outside of valves and pipes. Filtered, stackless application booths.

Project No.	**0638**

See all case studies →

KNOWLEDGE CENTER

More About Wet Enamel.



FUNDAMENTALS

What Is Wet Enamel (Slip Enamel)? Enameling by Dipping and Spraying

Applying water-based slip enamel by dipping, flow coating and spraying — for castings and complex geometries.

7 min read • Fundamentals



APPLICATION

Enamel Firing (Sintering) Furnaces and Temperatures

The 780–850 °C regime in which enamel fuses to metal, furnace types and energy.

6 min read • Application



COMPARISON

The Difference Between Powder Coating, Powder Enamel and Wet Enamel

Which part needs powder coating and which needs enamel? A decision guide based on temperature, durability and cost.

6 min read • Comparison

WHY STRONG3000?

The Engineering Difference.

We don't sell equipment and walk away; we stay with your line from design through commissioning and beyond.

Integrated Engineering

Machinery, electrical, automation and software under one roof — not sourced and assembled.

In-House Technology

Smart AI and OWL are original STRONG3000 technologies developed in-house.

Proven Experience

25+ years of engineering; installation, commissioning and service in 40+ countries.

24/7 Support

Phone, remote connection and 24/7 live support via WhatsApp.

Quotes & Technical Consulting

Tell us about your part, capacity and process. A STRONG3000 engineer will get back to you with a tailored proposal.

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FOR A QUOTE, PREPARE

- Product to Be Coated
- Max. Part Dimensions
- Required Capacity
- Number of Colors
- Daily Color Changes
- Coating Process
- Project Timeline

Values are typical ranges; final values are confirmed per project by STRONG3000 engineering. This sheet summarises the product page on our website; scan the QR code for the latest information.